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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/500,046

09/15/2004

Mamoru Usami

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05/19/2006

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ALEXANDRIA, VA 22320

EXAMINER

MALEVIC, DJURA

ART UNIT

PAPER NUMBER

2884

DATE MAILED: 05/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/500,046

Applicant(s)

USAMI ET AL.

Examiner

Djura Malëvic

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2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12 is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 11, 13 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 6/25/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6/25/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### **Information Disclosure Statement**

The information disclosure statement (IDS) filed on 6/25/2004 was considered by the examiner.

### **Claim Objections**

Regarding claims 4, 6 and 7, the phrase "and/or" renders the claim indefinite because it is unclear what in fact is claimed.

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,2,4,5 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hironori (JP Pub. 2000-049402) in view of Mickan et al. (US Pub. 20020074500 A1).

With regards to claim 1, Hironori discloses a spectrometering apparatus (Figure 13) comprising: two chambers 62 & 63 evacuated to achieve a vacuum state; a generator 1 that generates measuring light; an illumination optical system 1 & 64 & 65 that guides the measuring light onto a specimen 61a; a detector 6a that detects specimen light from the specimen and a detection optical system 66 & 67 & 6a that guides the specimen light from the specimen 61a irradiated with measuring light to the detector 6a wherein the generator 1, the illumination optical system 1 & 64 & 65, the

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detector 6a and the detection optical system 66 & 67 & 6a are disposed inside the evacuated chambers 62 & 63; and the specimen 61a is placed outside the evacuated chambers 62 & 63 [0034 – 0037]. However, Hironoria does not expressly disclose a chamber including a light transmission window. Mikan teaches a window which allows for transmission of the terahertz radiation [0050]. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Hironoria such as that taught by Mikan to include a transmission window to allow the terahertz radiation to the specimen. It also would have been obvious to include in Hironoria a transmission window, since it is conventionally used in that environment and would make Hironorian more efficient [0050].

With regards to claim 2, Hironori discloses a spectrometering apparatus (Figure 13) comprising: two chambers 62 & 63 evacuated to achieve a vacuum state; a generator 1 that generates terahertz pulse light; an illumination optical system 1 & 64 & 65 that guides the terahertz pulse light onto a specimen 61a; a detector 6a that detects specimen light from the specimen 61a and a detection optical system 66 & 67 & 6a that guides the specimen light from the specimen 61a irradiated with terahertz pulse light to the detector 6a wherein the generator 1, the illumination optical system 1 & 64 & 65, the detector 6a and the detection optical system 66 & 67 & 6a are disposed inside the evacuated chambers 62 & 63; and the specimen 61a is placed outside the evacuated chambers [0034 – 0037]. However, Hironoria does not expressly disclose a chamber including a light transmission window. Mikan teaches a window which allows for transmission of the terahertz radiation [0050]. Thus, it would have been obvious to a

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person of ordinary skill in the art at the time the invention was made to modify Hironoria such as that taught by Mickan to include a transmission window to allow the terahertz radiation to the specimen. It also would have been obvious to include in Hironoria a transmission window, since it is conventionally used in that environment and would make Hironorian more efficient [0050].

With regards to claim 4, Hironoria modified discloses a spectrometering apparatus (Figure 13) comprising: a laser light source 3a that generates laser pulse light; a splitter 33 that splits the laser pulse light generated by the laser light source into pump light to be guided to the generator 1 and probe light to be guided to the detector 6a; an optical path length altering device 35; a detector 6a which samples the specimen light from the specimen 61a entering via the transmission window in synchronization with an irradiation timing of the pump light and probe light; and a distance between the transmission window and the specimen is set larger than an optical path length altering range of the optical path length altering device [0034 –0037].

With regards to claim 5, Hironoria discloses a laser light source 3a, a splitter 33 and an optical path length-altering device 35 disposed outside the chamber (Figure 13).

With regards to claim 8, Hironori discloses a spectrometering apparatus (Figure 13) comprising: chambers 62 & 63 purged with gas which does not absorb terahertz pulse light, a generator 1 that generates terahertz pulse light, an illumination optical system 1 & 64 & 65, a detector 6a, a detection optical system 66 & 67 & 6a wherein the generator 1, the illumination optical system 1 & 64 & 65, the detector 6a and the detection optical system 66 & 67 & 6a are disposed inside the chambers 62 & 63 and

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the specimen 61a is placed outside the chambers 62 & 63 [0034 – 0037]. However, Hironoria does not expressly disclose a chamber including a light transmission window. Mickan teaches a window which allows for transmission of the terahertz radiation [0050]. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Hironoria such as that taught by Mickan to include a transmission window to allow the terahertz radiation to the specimen. It also would have been obvious to include in Hironoria a transmission window, since it is conventionally used in that environment and would make Hironorian more efficient [0050].

With regards to claim 9, Hironoria modified discloses a fluid tank formed so as to allow the specimen to be immersed therein in a fluid with a small absorption coefficient for terahertz light and allow the fluid to be in contact with an outer surface or the transmission window and disposed outside the chamber. Hironoria modified also discloses the illumination optical system guiding the terahertz pulse light onto the specimen via the transmission window and the fluid inside the fluid tank and Hironoria also discloses the detector receiving the specimen light via the fluid inside the fluid tank and transmission window [0034 – 0037].

With regards to claim 10, Hironoria modified discloses that draining the chamber 61 is performed in advance but does not expressly disclose using a gas jet device [0036]. However, gas jet devices are regularly used and accepted as standard in the subject matter area of the invention. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include a gas jet device for

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draining the chamber 61, since it is conventionally used in that environment and would make the Spectrometer more efficient.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hironoria and Mickan in view of Arnone (WO 00/75641 A1).

With regards to claim 3, Hironoria modified discloses the spectrometering apparatus as claimed in claim 2 but does not expressly disclose the window comprising polyethylene or quartz. Arnone teaches a window comprising polyethylene or quartz (Page 7, Line 28 – Page 8, Line 5). Thus, it would of have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Hironoria to include a window comprising polyethylene or quartz such as taught by Arnone in order to let the Thz light pass through the window, since the window would be substantially transparent to Thz light and as a result irradiating the specimen with more efficiency (Page 7, Line 28 – Page 8, Line 5).

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hironoria and Mickan in view of Jacobsen et al. (US Patent 5,939,721).

With regards to claims 6 and 7, Hironoria modified discloses a spectrometering apparatus (Figure 13) comprising: a laser light source 3a that generates laser pulse light; a splitter 33 that splits the laser pulse light generated by the laser light source 3a into pump light to be guided to the generator 1 and probe light to be guided to the detector 6a; an optical path length altering device 35; a detector 6a which samples the specimen light from the specimen entering via the transmission window in synchronization with an irradiation timing of the pump light and probe light; and a

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processor 73. Hironoria does not expressly disclose the processor 73 separating and removing the signal attributable to multiple reflected light resulting from reflection at the transmission window. However, Mickan teaches that radiation reflected back from the transmission window causes spurious radiation [0050]. Also, Jacobsen teaches that one may extract relevant information avoiding multiple reflected waveforms and background scattering using relevant algorithms with a digital signal processor (Col. 3, Line 1++). Thus, it would have been obvious to a person of ordinary skill in the art to modify Hironoria to include a DSP such as taught by Jacobsen to remove signals attributable to reflected light resulting from reflection at the transmission window such as taught by Mickan in order to avoid spurious terahertz radiation.

**Allowable Subject Matter**

Claims 11, 13 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 12 is allowed.

The following is a statement of reasons for the indication of allowable subject matter:

With regards to claim 11, the prior art on record does not suggest or teach a spectrometer comprising a connecting member that displaceably passes through a barrier wall of the chamber with airtight sealing and connects the base and holder to fix positions in combination with the rest of the claim limitations. As such, applicant's disclosure provides a novel and nonobvious improvement over the prior art.



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With regards to claim 12, the prior art on record does not suggest or teach a spectrometer including a light radiation unit disposed inside the second vacuum chamber guiding measuring light onto the specimen in the first vacuum chamber via the light transmission window and a connecting member that displaceably passes through a barrier wall of the chamber with airtight sealing and connects the base and holder to fix positions in combination with the rest of the claim limitations. As such, applicant's disclosure provides a novel and nonobvious improvement over the prior art.

Claims 13 and 14 would also be allowable by virtue of their dependency on claim 11.

### **Conclusion**


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Djura Malevic whose telephone number is 571.272.5975. The examiner can normally be reached on Monday - Friday between 8:30am and 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Djura Malevic**  
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